

Operating instructions Precision balance

KERN PKP / PKS

Version 1.3
06/2013
GB



Table of Contents

1	Technical Data.....	4
2	Basic Information (General)	7
2.1	Proper use.....	7
2.2	Improper Use	7
2.3	Warranty	7
2.4	Monitoring of Test Resources	7
3	Basic Safety Precautions	8
3.1	Pay attention to the instructions in the Operation Manual	8
3.2	Personnel training	8
4	Transportation & Storage	8
4.1	Testing upon acceptance	8
4.2	Packaging / return transport	8
5	Unpacking, Setup and Commissioning.....	9
5.1	Installation Site, Location of Use	9
5.2	Unpacking	9
5.2.1	Placing	9
5.3	Mains connection	9
5.4	Connection of peripheral devices.....	9
5.5	Initial Commissioning	9
5.6	Adjustment.....	10
5.7	Adjustment.....	10
6	Operation	11
6.1	Screen and operation.....	11
6.2	How to turn on/off balance	12
6.3	Basic Settings.....	13
6.4	Operating mode Counting	16
6.5	Operating mode Totalizing	17
6.6	Operating mode Dispensing	18
6.7	Operating mode Check weighing	19
6.8	Operating mode Percent.....	20
6.9	Operating mode Animal weighing	21
6.10	Screen Operating mode Recipe	22
6.11	Operating mode Grammage	23
7	Print form	24
7.1	Contents of the form impression.....	24
7.2	Arrangement of form printout	25

8	Interfaces	26
8.1	Data output RS 232 C	26
8.2	Interface RS 232C	26
8.2.1	There are 4 kinds of data output via RS 232C.....	27
8.2.2	Explanation of the data transfer	27
8.3	Printer	28
8.4	Underfloor weighing.....	28
9	Service, maintenance, disposal.....	29
9.1	Cleaning.....	29
9.2	Service, maintenance	29
9.3	Disposal.....	29
10	Instant help.....	30
11	Declaration of conformity.....	31

1 Technical Data

Models PKS:

KERN	PKS 200-3	PKS 360-3	PKS 2000-2	PKS 3600-2	PKS 10K0.1
Readability (d)	0,001 g	0,001 g	0,01 g	0,01 g	0,1 g
Weighing range (max)	200 g	360 g	2.000 g	3.600 g	10.000 g
Taring range (subtractive)	200 g	360 g	2.000 g	3.600 g	10.000 g
Reproducibility	0,001 g	0,002 g	0,01 g	0,02 g	0,1 g
Linearity	±0,003 g	±0,005 g	±0,03 g	±0,05 g	±0,3 g
Smallest piece weight	0,001 g	0,001 g	0,01 g	0,01 g	0,1 g
Adjustment points	50/100/150/ 200 g	100/200/300 /360 g	0,5/1,0/1,5/ 2,0 kg	1,0/2,0/3,0/ 3,6 kg	2/5/10 kg
Recommended adjusting weight F1 (not supplied)	200 g	200g + 100g	2000 g	2 kg+1 kg	10 kg
Humidity of air	max. 80% rel. (non-condensing)				
Stabilization time (typical)	3 sec.				
Allowable ambient temperature	+10 °C ... + 40 °C				
Warm-up time	2 hours	4 hours	2 hours	4 hours	2 hours
Housing (B x D x H) mm	167 x 250 x 85				
Vibration filter	yes				
Weighing plate stainless steel mm	Ø 81		130 x 130		150 x 170
Units	see menu				
Weight kg (net)	1	1	1,5	1,5	1,7
Data interface	yes (RS232)				

Models PKP:

KERN	PKP 300-3	PKP 420-3	PKP 3000-2	PKP 4200-2
Readability (d)	0,001 g	0,001 g	0,01 g	0,01 g
Weighing range (max)	300 g	420 g	3.000 g	4.200 g
Taring range (subtractive)	300 g	420 g	3.000 g	4.200 g
Reproducibility	0,002 g	0,002 g	0,02 g	0,02 g
Linearity	±0,005 g	±0,005 g	±0,05 g	±0,05 g
Smallest piece weight	0,001 g	0,001 g	0,01 g	0,01 g
Adjustment points	50/100/200/ 300 g	100/200/300/ 400 g	1.0/1,5/2,0/3,0 kg	1.0/2,0/3,0/4,0 kg
Recommended adjusting weight F1 (not supplied)	200 g + 100 g	200 g + 200 g	2 kg + 1 kg	2 kg + 2 kg
Humidity of air	max. 80% rel. (non-condensing)			
Stabilization time (typical)	3 sec.			
Permitted environmental temperature	+10 °C ... + 40 °C			
Warm-up time	4 hours	4 hours	4 hours	4 hours
Housing (B x D x H) mm	180 x 310 x 90			
Vibration filter	yes			
Weighing plate stainless steel mm	Ø 106		Ø 150	
Units	see menu			
Weight kg (net)	2,3			
Data interface	yes (RS232)			

KERN	PKP 12K0.05	PKP 16K0.1	PKP 24K0.1
Readability (d)	0,05 g	0,1 g	0,1 g
Weighing range (max)	12.000 g	16.000 g	24.000 g
Taring range (subtractive)	12.000 g	16.000 g	24.000 g
Reproducibility	0,05 g	0,1 g	0,1 g
Linearity	±0,15 g	±0,3 g	±0,3 g
Smallest piece weight	0,05 g	0,1 g	0,1 g
Adjustment points	2/5/10/12 kg	5/10/15/16 kg	5/10/15/20/24 kg
Recommended adjusting weight F1 (not supplied)	10 kg	10 kg + 5 kg	20 kg
Humidity of air	max. 80% rel. (non-condensing)		
Stabilization time (typical)	3 sec.		
Permitted environmental temperature	+10 °C ... + 40 °C		
Warm-up time	2 hours	2 hours	2 hours
Housing (B x D x H) mm	180 x 310 x 90		
Vibration filter	yes		
Weighing plate stainless steel mm	160 x 200		
Units	see menu		
Weight kg (net)	2,7		
Data interface	yes (RS232)		

2 Basic Information (General)

It is absolutely necessary that you read and understand the operating instructions prior to installation and commissioning and follow the instructions during the process!

2.1 Proper use

The balance you purchased is intended to determine the weighing value of material to be weighed. It is intended to be used as a “non-automatic” balance, i.e. the material to be weighed is manually and carefully placed in the centre of the weighing plate. As soon as a stable weighing value is reached the weighing value can be read.

2.2 Improper Use

Do not use balance for dynamic weighing. In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the “stability compensation” in the balance (Example: Slowly draining fluids from a container on the balance.).

Do not leave permanent load on the weighing plate. This may damage the measuring system.

Impacts and overloading exceeding the stated maximum load (max) of the balance, minus a possibly existing tare load, must be strictly avoided. Balance may be damaged by this.

Never operate balance in explosive environment. The serial version is not explosion protected.

The structure of the balance may not be modified. This may lead to incorrect weighing results, safety-related faults and destruction of the balance.

The balance may only be used according to the described conditions. Other areas of use must be released by KERN in writing.

2.3 Warranty

Warranty claims shall be voided in case

- Our conditions in the operation manual are ignored
- The appliance is used outside the described uses
- The appliance is modified or opened
- mechanical damage and damage caused by media, liquids
- natural wear and tear
- The appliance is improperly set up or incorrectly electrically connected
- The measuring system is overloaded

2.4 Monitoring of Test Resources

In the framework of quality assurance the measuring-related properties of the balance and, if applicable, the testing weight, must be checked regularly. The responsible user must define a suitable interval as well as type and scope of this test. Information is available on KERN's home page (www.kern-sohn.com) with regard to the monitoring of balance test substances and the test weights required for this. Our accredited DKD calibration laboratory offers fast and inexpensive adjustment for test weights and weighing balances (reset to national normal weight).

3 Basic Safety Precautions

3.1 Pay attention to the instructions in the Operation Manual



Carefully read this operation manual before setup and commissioning, even if you are already familiar with KERN balances.

Versions in other languages are non-binding translations.
The only binding version is the original document in German.

3.2 Personnel training

The appliance may only be operated and maintained by trained personnel.

4 Transportation & Storage

4.1 Testing upon acceptance

When receiving the appliance, please check packaging immediately, and the appliance itself when unpacking for possible visible damage.

In case of visible damage have the damage verified by the messenger's signature. Do not alter goods or packaging and do not remove any parts of the delivery. Report the damage immediately (within 24 hours) in writing to the parcel service.

4.2 Packaging / return transport



- ⇒ Keep all parts of the original packaging for a possibly required return.
- ⇒ Only use original packaging for returning.
- ⇒ Prior to dispatch disconnect all cables and remove loose/mobile parts.
- ⇒ Reattach possibly supplied transport securing devices.
- ⇒ Secure all parts such as the glass wind screen, the weighing platform, power unit etc. against shifting and damage.

5 Unpacking, Setup and Commissioning

5.1 Installation Site, Location of Use

The balances are designed in a way that reliable weighing results are achieved in common conditions of use.

You will work accurately and fast, if you select the right location for your balance.

Therefore, observe the following for the installation site:

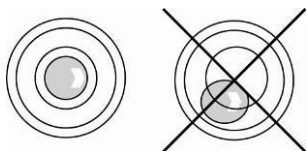
- Place the balance on a firm, level surface;
- Avoid extreme heat as well as temperature fluctuation caused by installing next to a radiator or in the direct sunlight;
- Protect the balance against direct draughts due to open windows and doors;
- Avoid jarring during weighing;
- Protect the balance against high humidity, vapors and dust;
- Do not expose the device to extreme dampness for longer periods of time. Non-permitted condensation (condensation of air humidity on the appliance) may occur if a cold appliance is taken to a considerably warmer environment. In this case, acclimatize the disconnected appliance for ca. 2 hours at room temperature.
- Avoid static charging of the material to be weighed, weighing container and windshield.

If electro-magnetic fields or static charge occur, or if the power supply is unstable major deviations on the display (incorrect weighing results) are possible. In that case, the location must be changed.

5.2 Unpacking

Carefully remove the balance from the packaging, remove plastic cover and setup balance at the intended workstation.

5.2.1 Placing



Level balance with foot screws until the air bubble of the water balance is in the prescribed circle.

5.3 Mains connection

Power is supplied via the external mains adapter. The stated voltage value must be the same as the local voltage.

Only use original KERN mains adapters. Using other makes requires consent by KERN.

5.4 Connection of peripheral devices

Before connecting or disconnecting of additional devices (printer, PC) to the data interface, always disconnect the balance from the power supply. With your balance, only use accessories and peripheral devices by KERN, as they are ideally tuned to your balance.

5.5 Initial Commissioning

A warming up time of 2 hours after switching on stabilizes the measuring values.

The accuracy of the balance depends on the local acceleration of gravity.

Strictly observe hints in chapter "Adjustment".

5.6 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, each balance must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the balance has not already been adjusted to the location in the factory). This adjustment process must be carried out during the initial start-up, after change in location and variation of surrounding temperature. To receive accurate measuring values it is also recommended to adjust the balance periodically in weighing operation.

5.7 Adjustment

With an adjustment weight, the weighing accuracy can be checked and re-adjusted at any time.

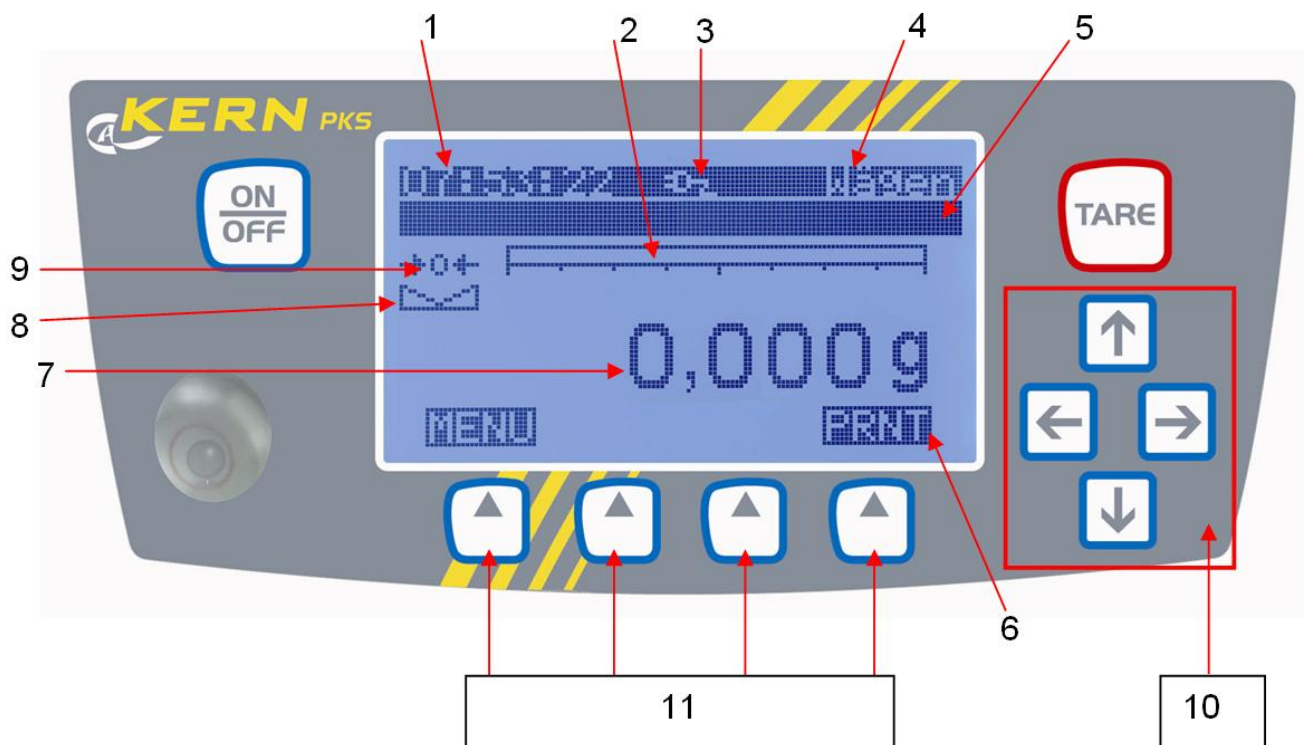
Attention: In the verified balances the adjustment is not possible.

Procedure when adjusting:

Observe stable environmental conditions. A short warming up time of ca. 15 minutes is recommended for stabilization.

6 Operation

6.1 Screen and operation

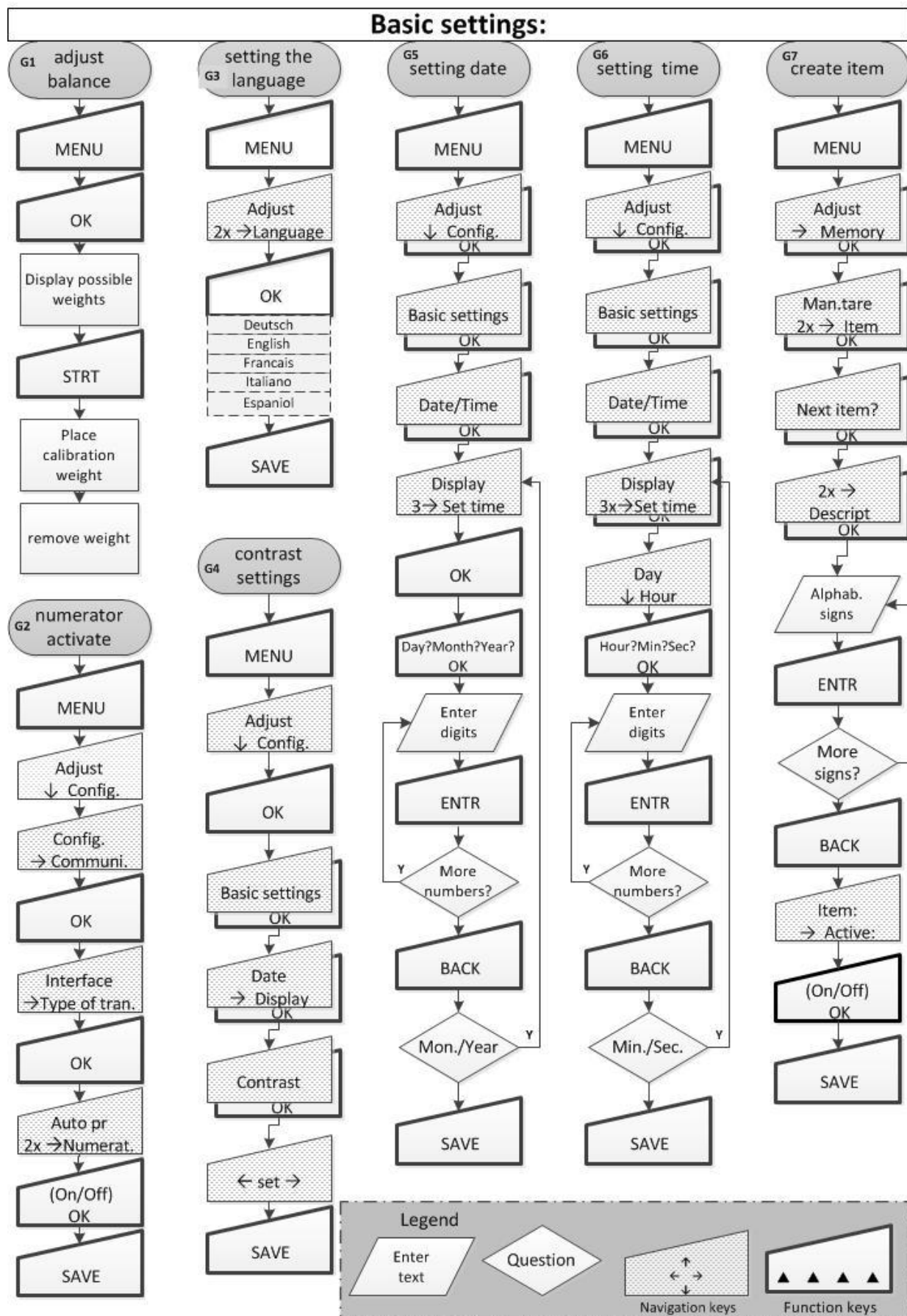


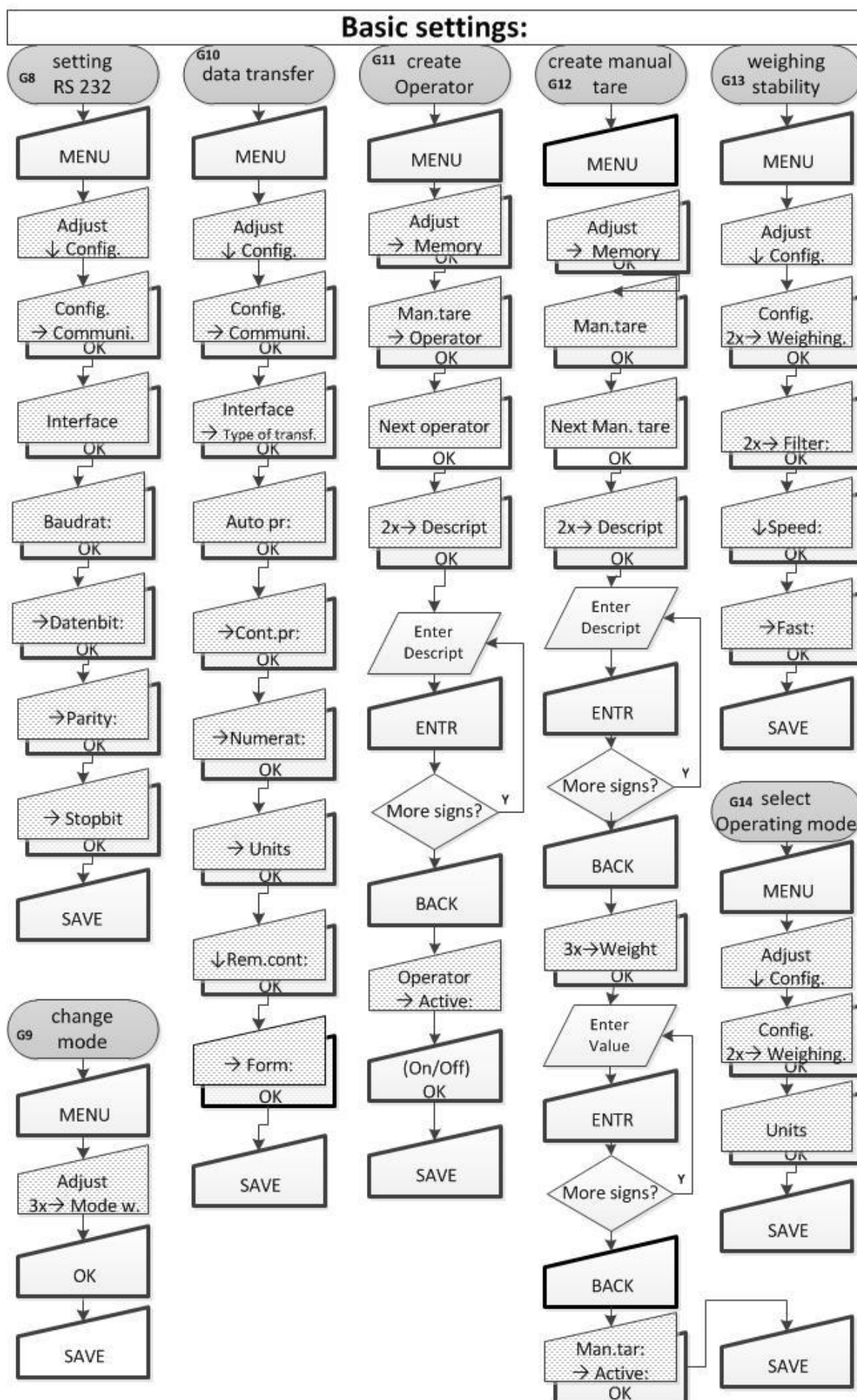
1. Time
2. Range display
3. Network operation / rechargeable battery operation
4. Operation mode
5. Info line – Item description/Operator
6. Info fields for functions and confirmation
7. Weight value or operating mode relative indications
8. Weighing stoppage
9. Zero setting display
10. Navigation keys
11. Functional and acknowledgement buttons

6.2 How to turn on/off balance

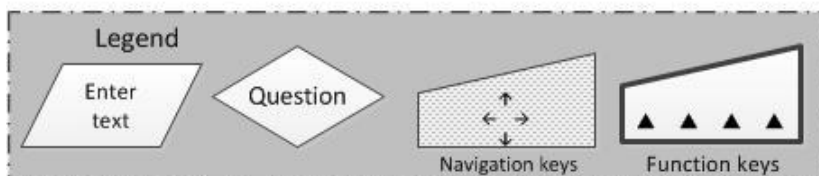
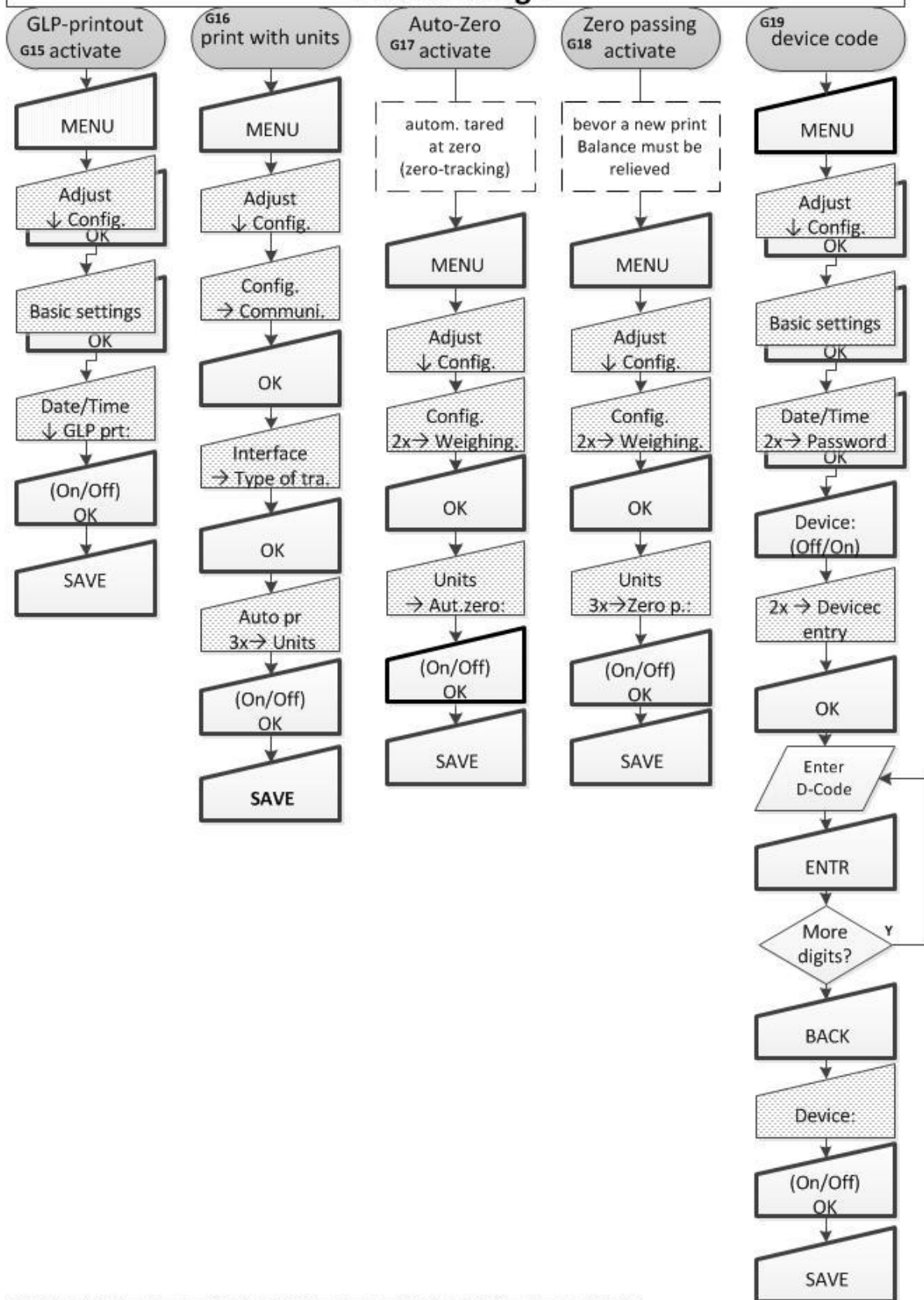
Turn balance on/off by using the ON/OFF button

6.3 Basic Settings

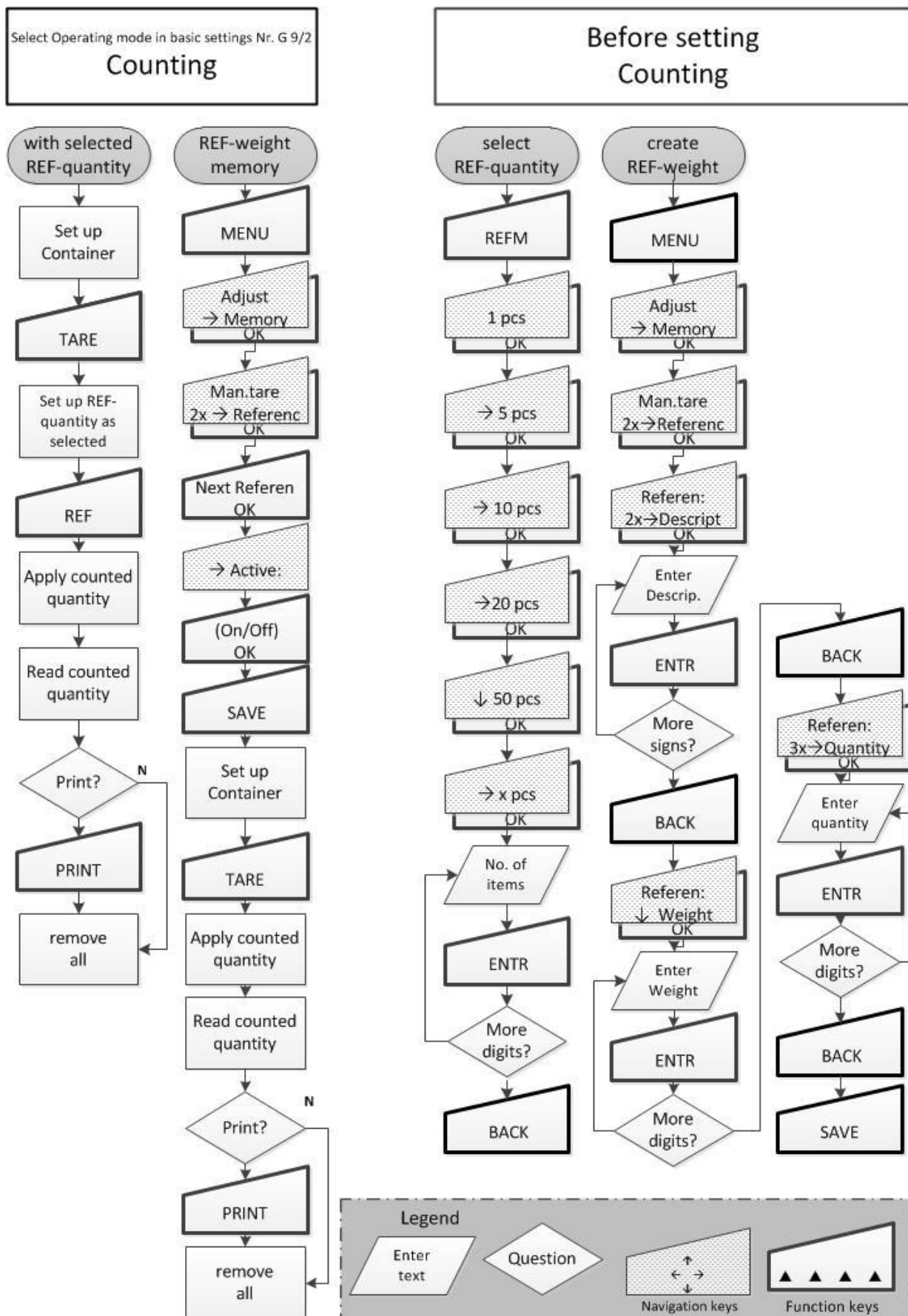




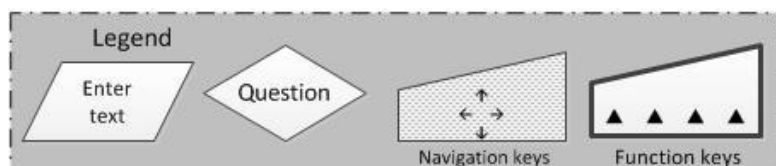
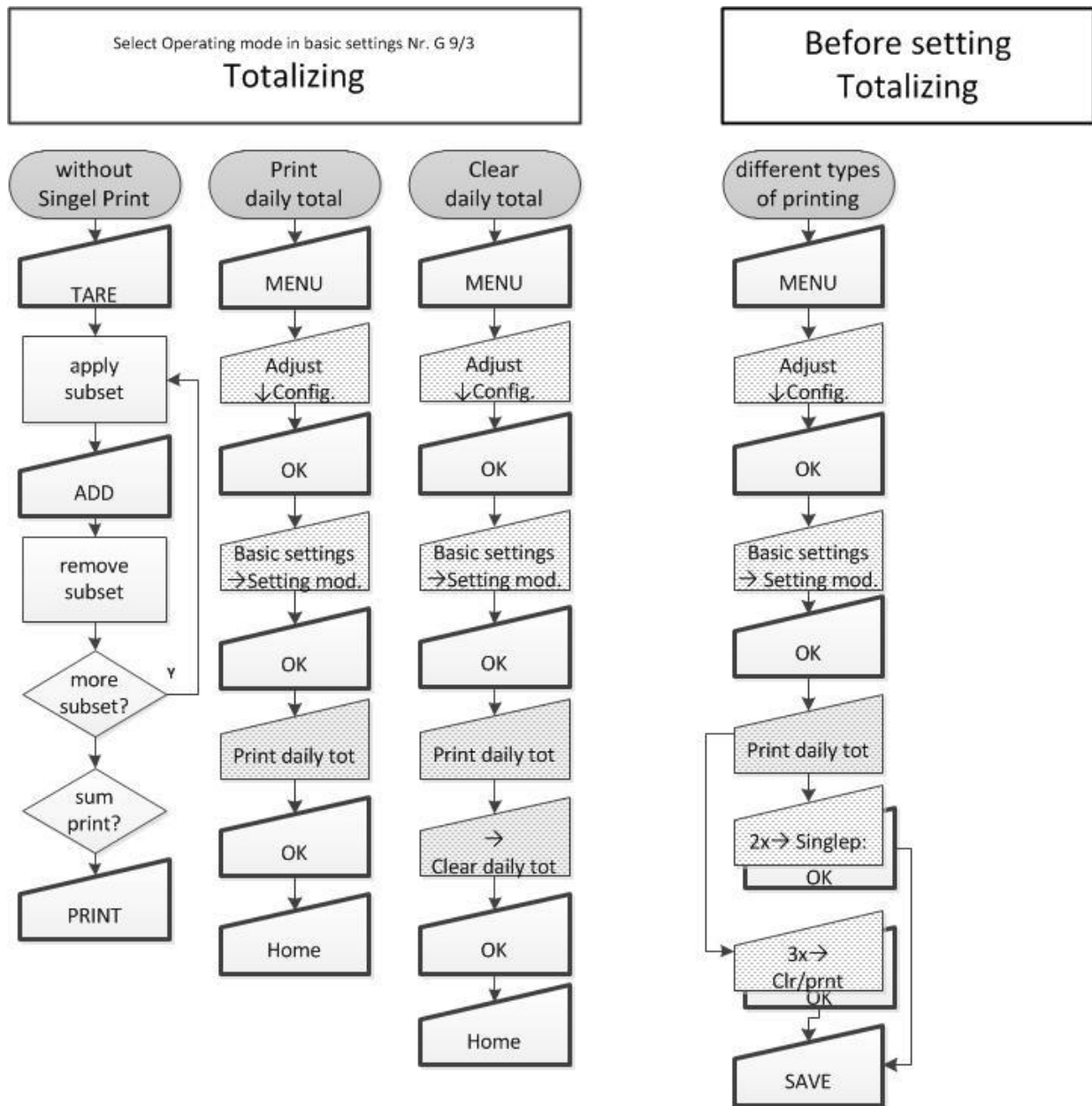
Basic settings:



6.4 Operating mode Counting

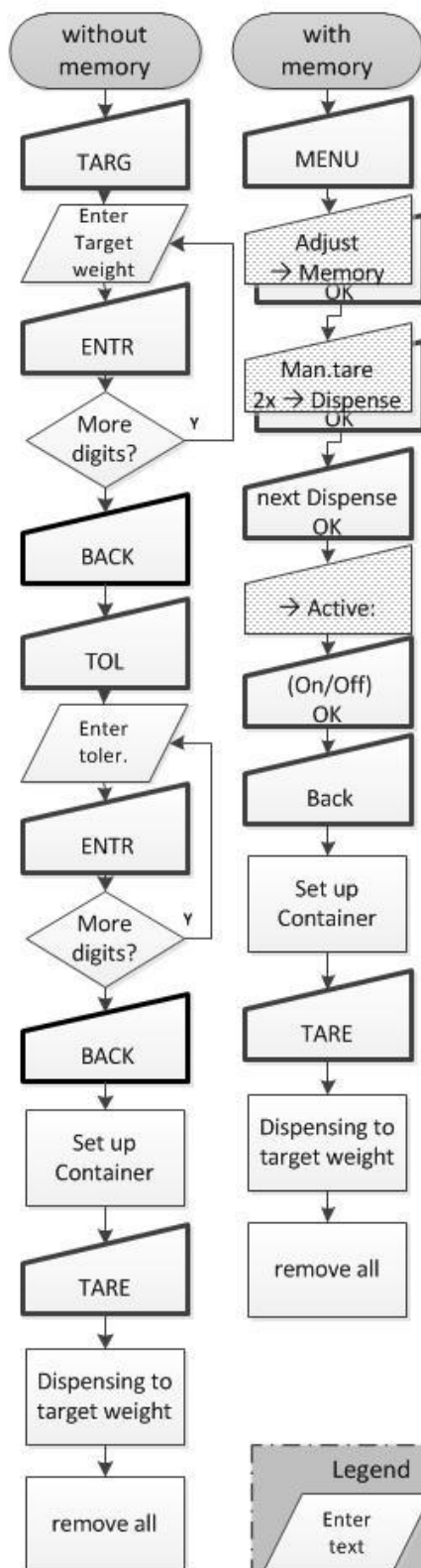


6.5 Operating mode Totalizing

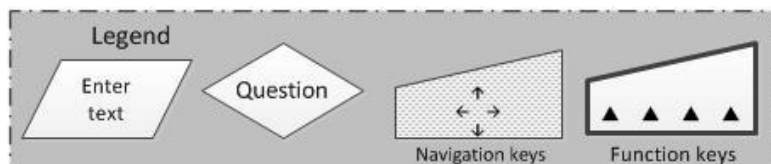
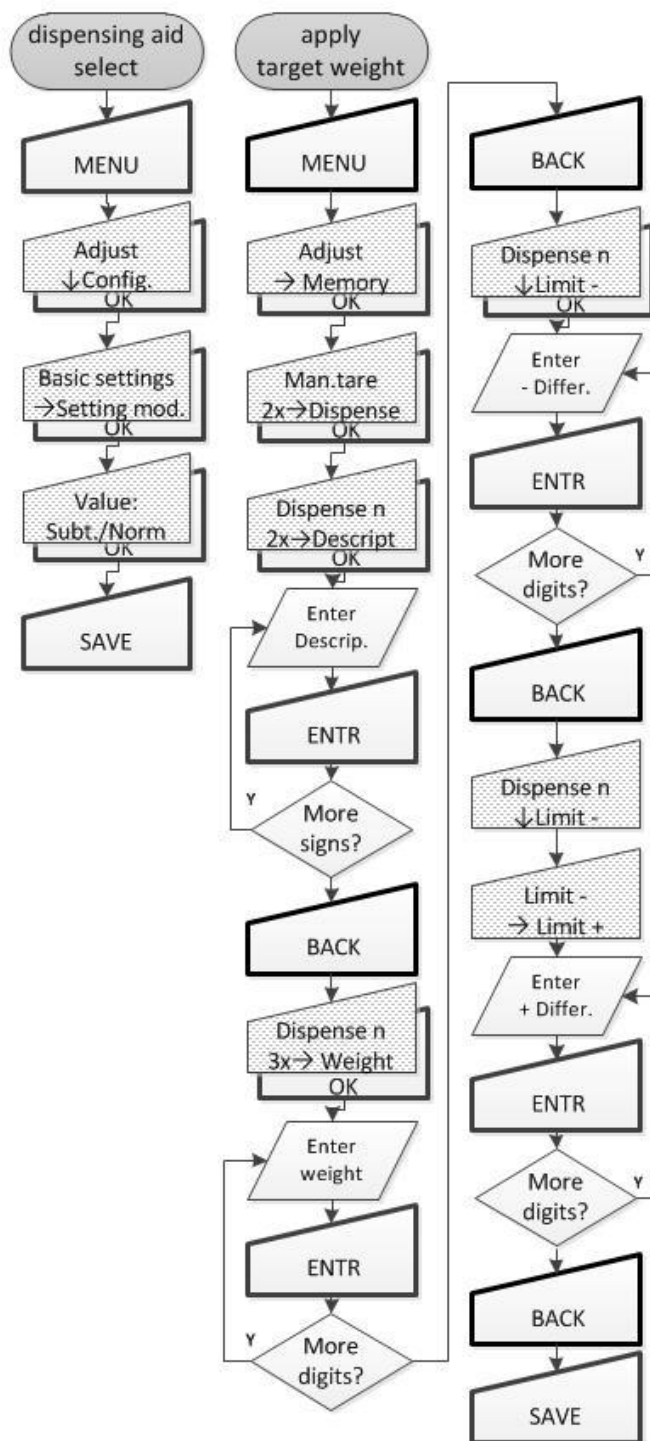


6.6 Operating mode Dispensing

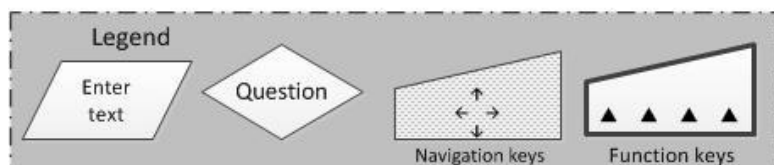
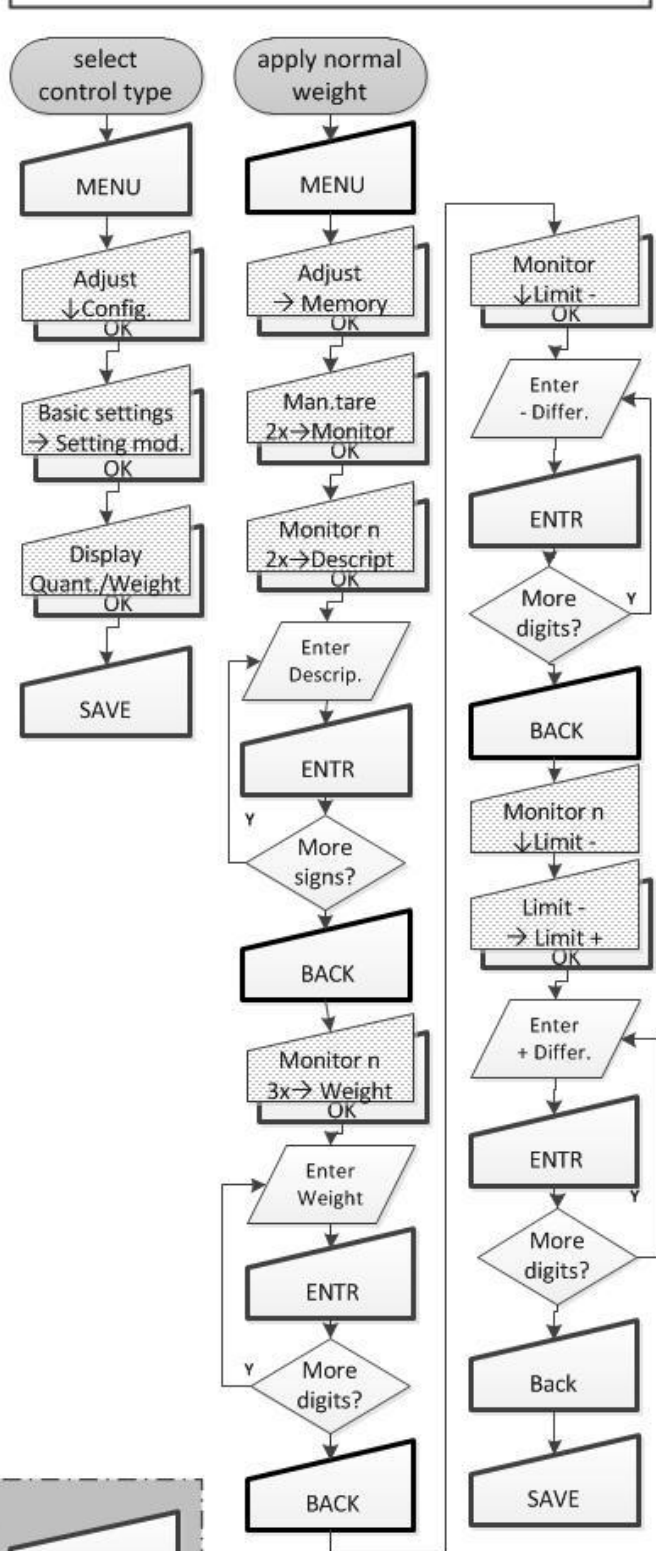
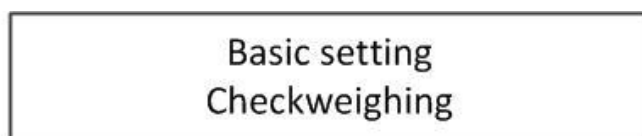
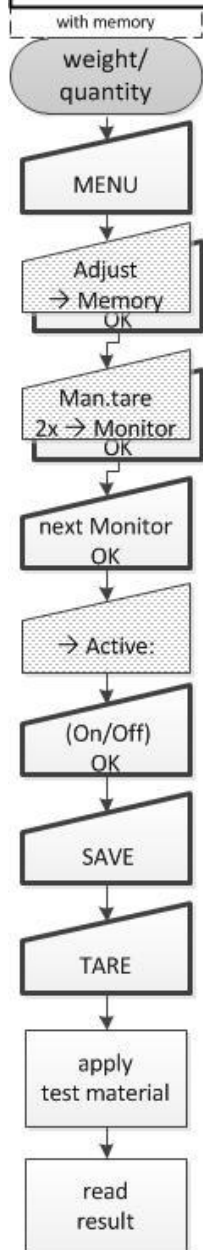
Select Operating mode in basic settings Nr. G 9/7
Dispensing



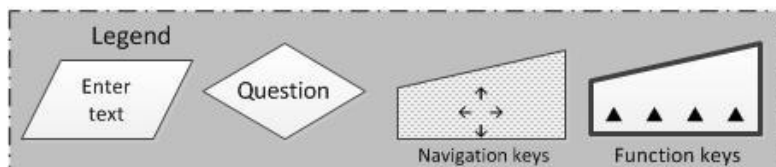
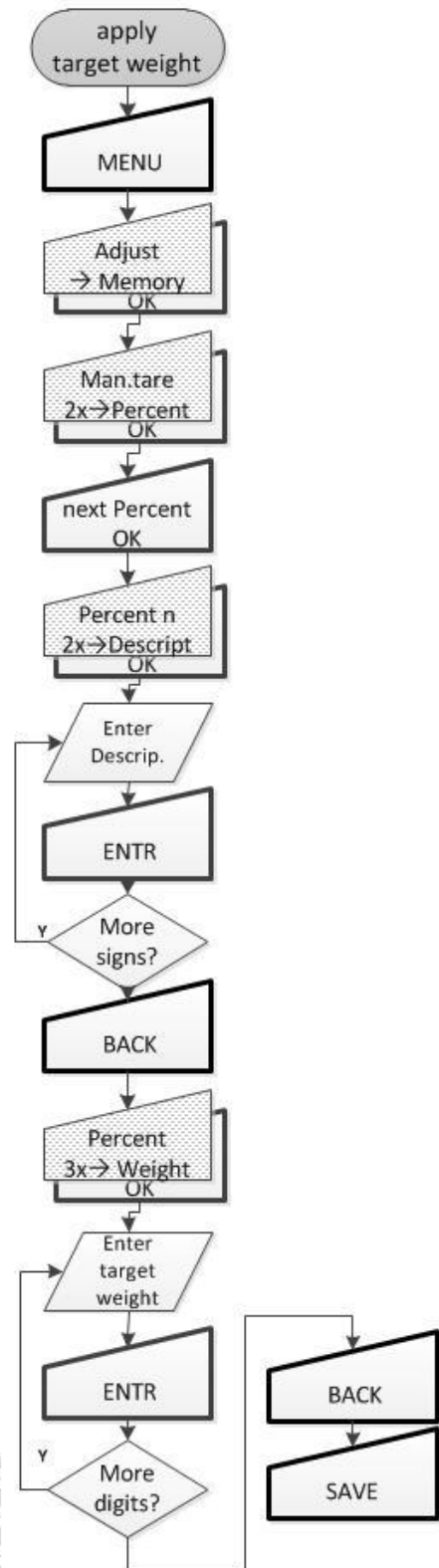
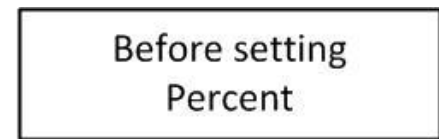
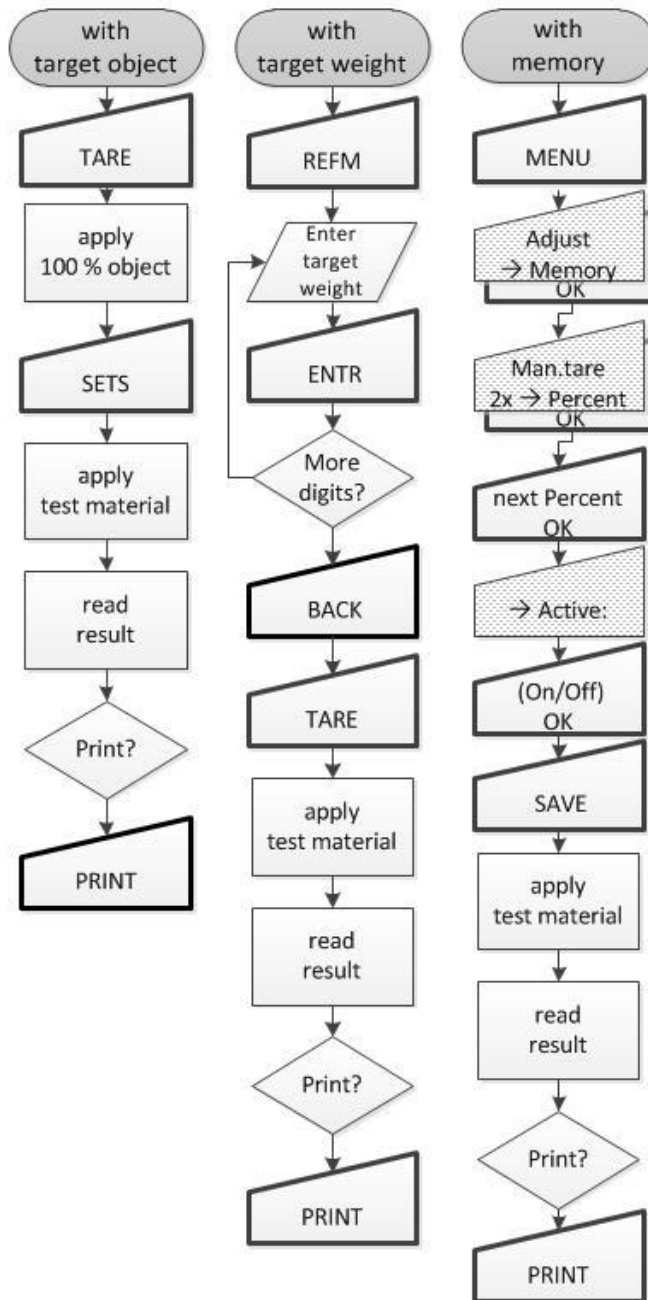
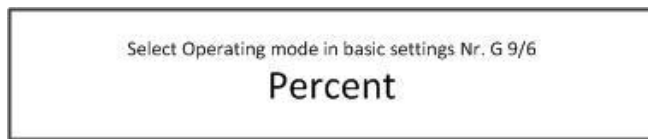
Before setting Dispensing



6.7 Operating mode Check weighing

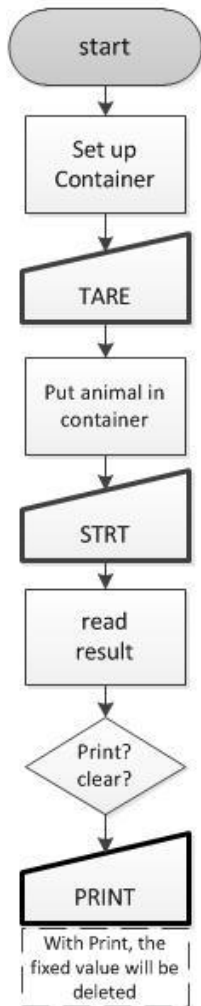


6.8 Operating mode Percent

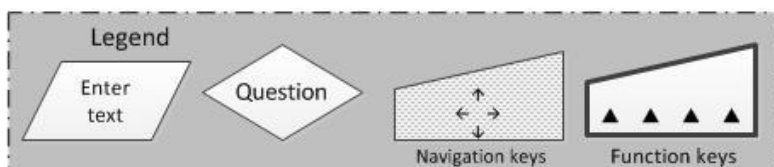
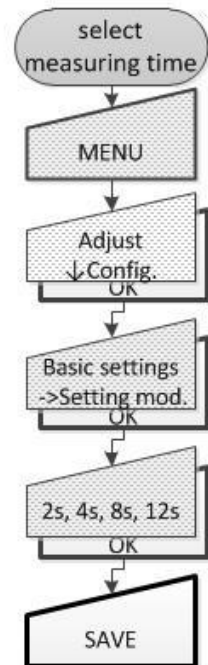


6.9 Operating mode Animal weighing

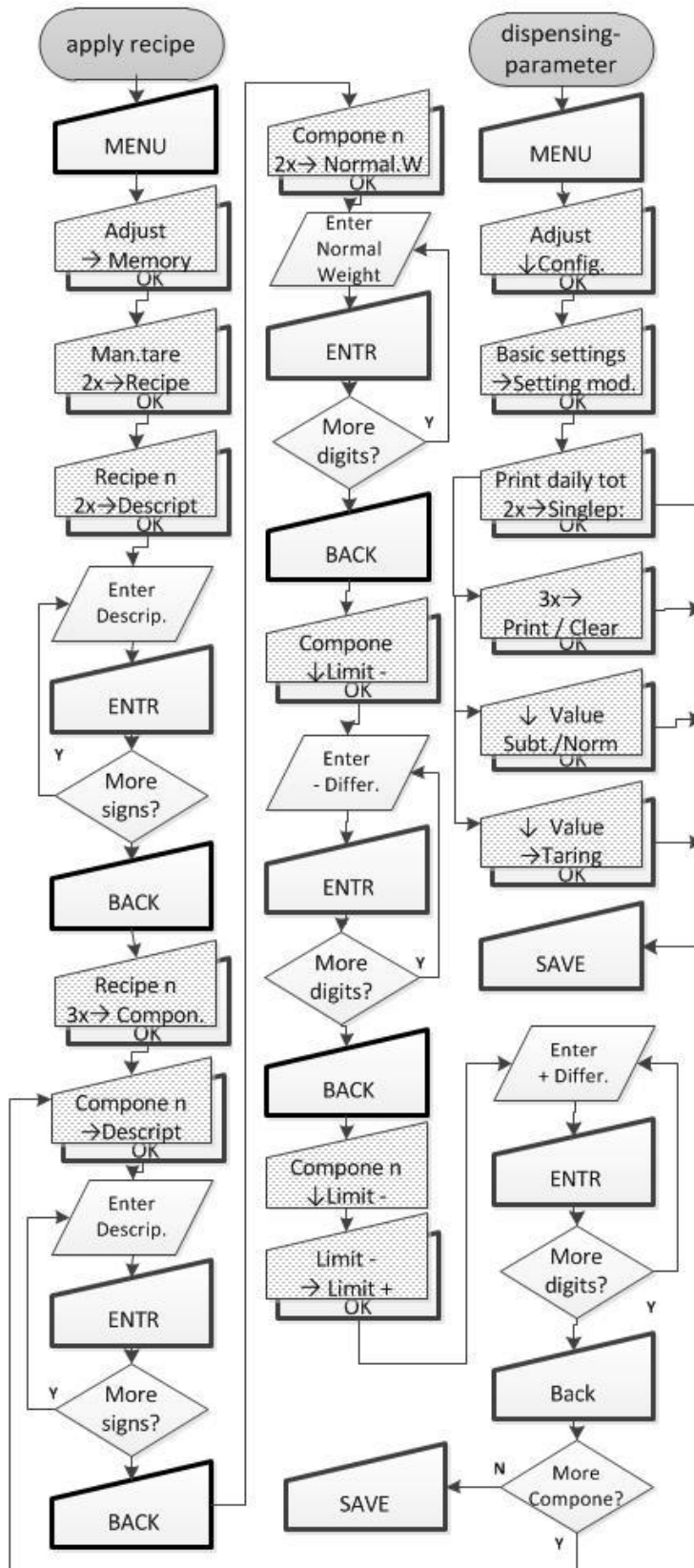
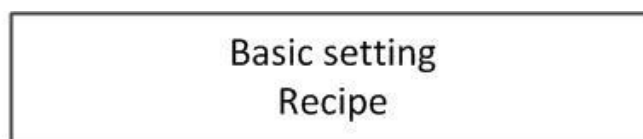
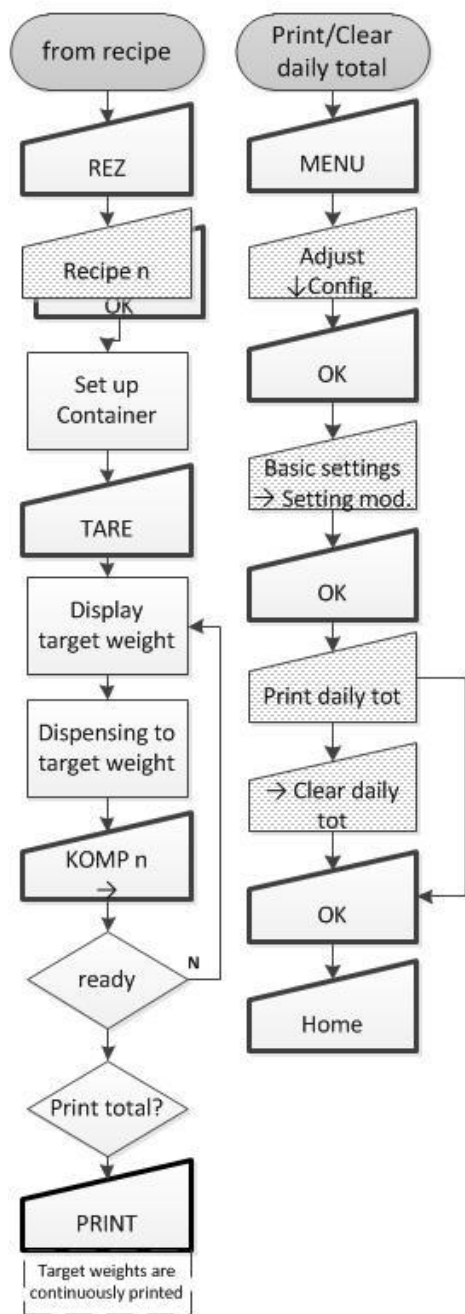
Select Operating mode in basic settings Nr. G 9/8
Animal weighing



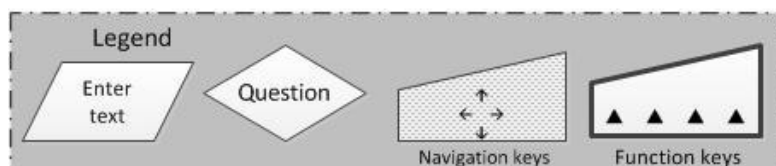
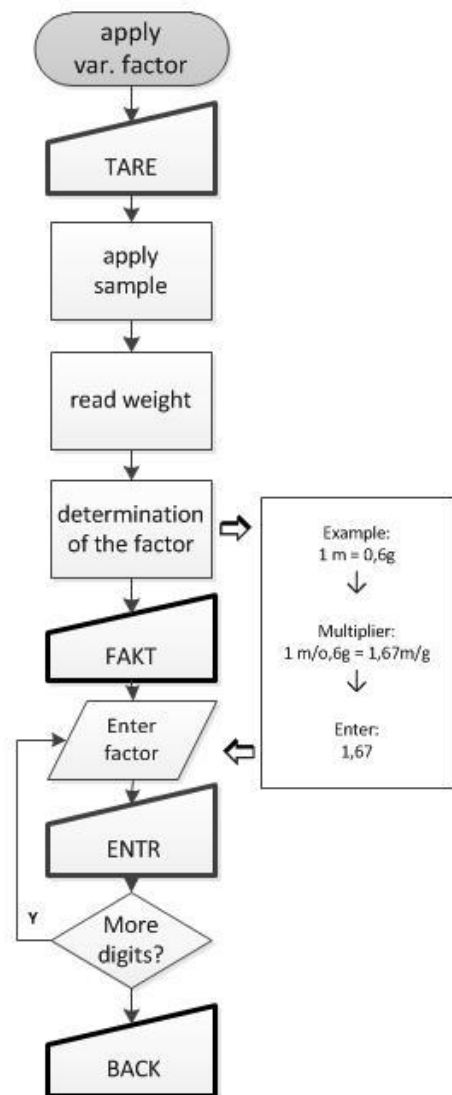
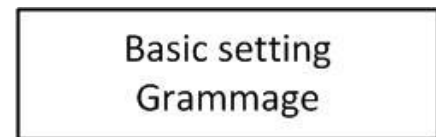
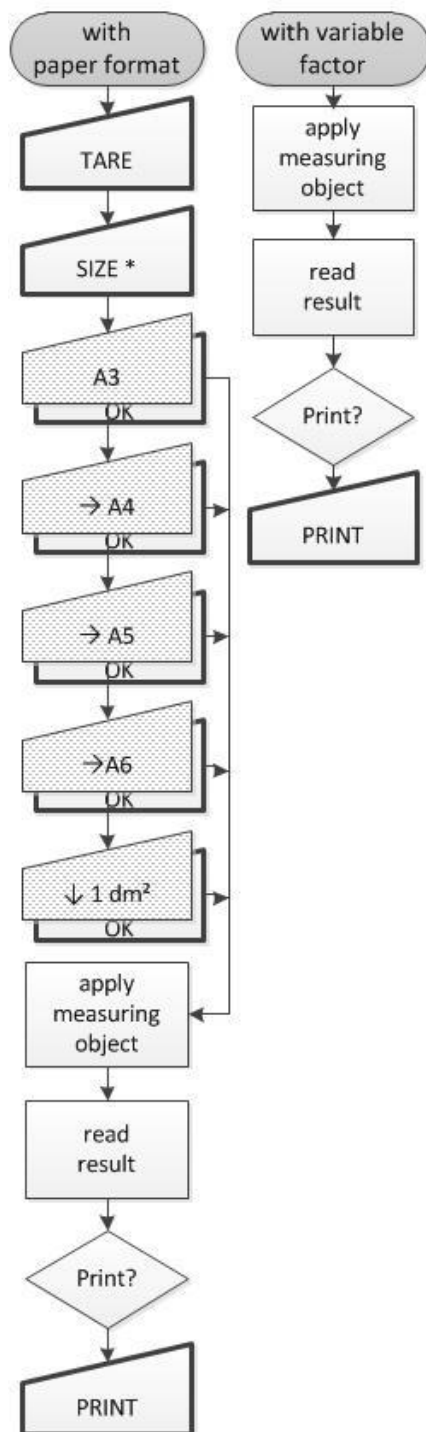
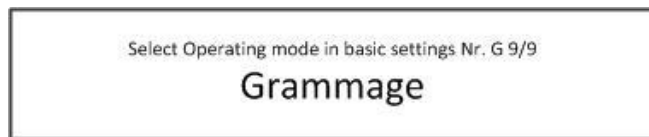
Before setting Animal weighing



6.10 Screen Operating mode Recipe

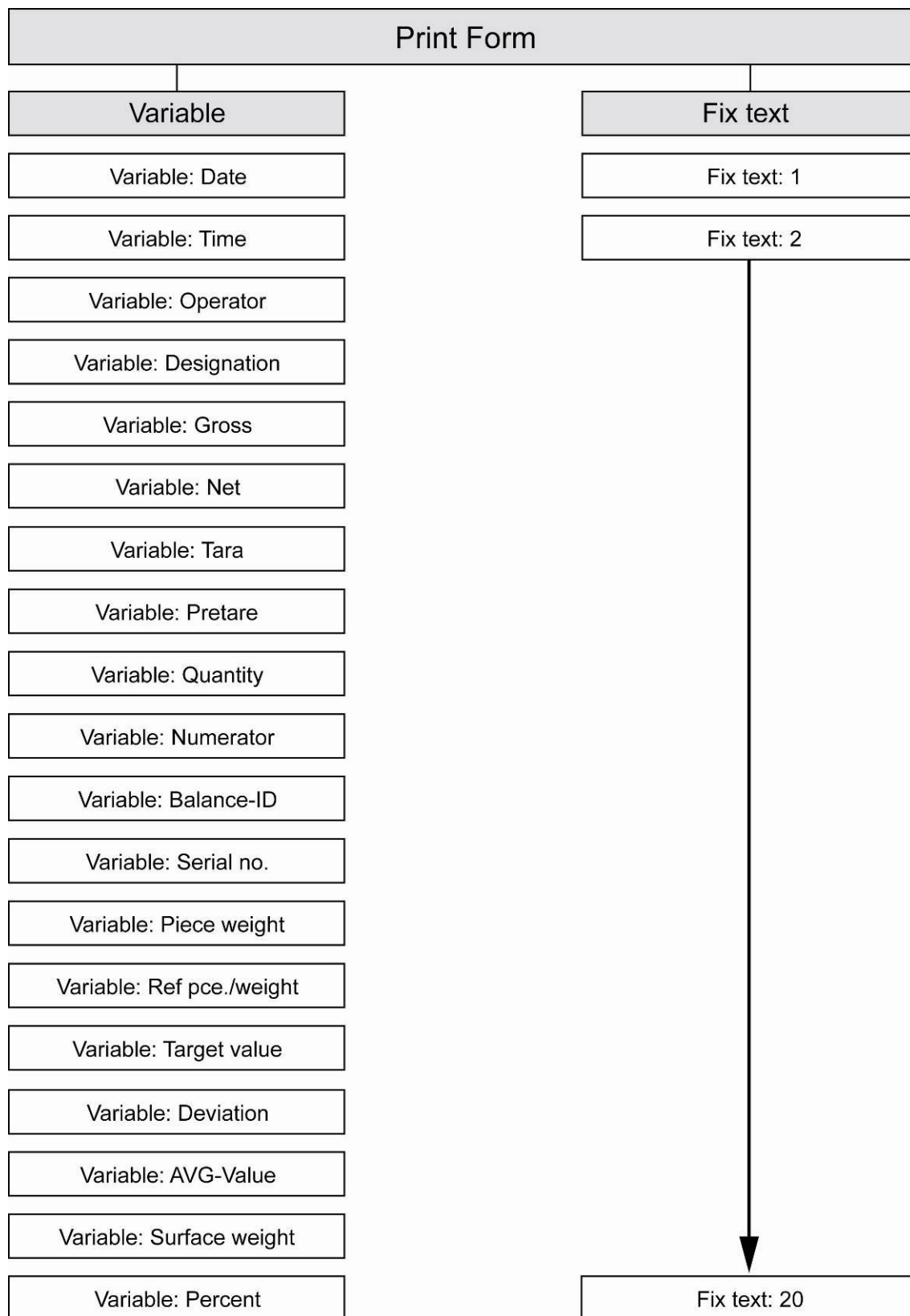


6.11 Operating mode Grammage



7 Print form

7.1 Contents of the form impression



7.2 Arrangement of form printout

Variable	
Variable: Gross	Activated: ON
Line 2	Column 1
Printout “Gross“ line 2 / column 1	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx 1. line 1500,00 g xxxxxxxxxxxxxxxx 2. line
Printout “Gross“ line 2 / column 12	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx 1. line xxxxxxxxxxxx1500,0 g xxxxx 2. line

Fix text	
Fix text 1	Activated: ON
Line 2	Column 1
Designation „Gross“	
Printout “Designation contents“ Line 2 / column 1	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx 1. line Gross : xxxxxxxxxxxxxxxxxxxx 2. line

Combination of fix text and variable	
Fix text “Gross:“ -line 2 / column 1	
Variable “gross value“ – line 2 / column 12	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx 1. line Gross : xxx1500,0 g xxxxxx 2. line

x = space character

- The fields „line“ and „column“ are position printing input fields
- Field „Variable“ is a selection field of fixed printing possibilities
- Field „Fix text“ offers the possibility to specify texts for printout.
- The field „designation“ is a text input field to add information such as gross, tare, net, pcs to the values.
- Field „Activated: on“ takes over this line into the print form.

8 Interfaces

8.1 Data output RS 232 C

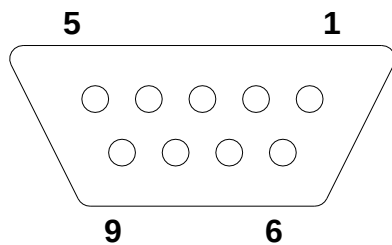
Technical data:

8-bit ASCII Code

- 1 start bit, 8 data bits, 1 stop bit, no parity bit
- Baud rate selectable from 2400, 4800, 9600 Baud (factory setting) and 19200 Baud.
- Sub-D plug 9-channel required
- For operation with interface faultless operation is only ensured with the correct KERN – interface cable (max. 2m)

Pin allocation of the balance output socket (front view)

Sub-D jack 9-channel



Pin 2: Transmit data

Pin 3: Receive data

Pin 5: Signal ground

8.2 Interface RS 232C

Data output via interface RS 232C

General

The previous condition for the data transfer between balance and a peripheral device (e.g. printer, PC ...) is that the appliances are set to the same interface parameters (e.g. baud rate, parity ...).

8.2.1 There are 4 kinds of data output via RS 232C

Data output using the PRINT key

The printing process can be triggered by pressing the PRINT key.

The settings AUTOPRINT and AUTOPRINT should be disabled for this process.

AUTOPRINT (data output according to weight application)

The setting AUTOPRINT is located on the menu item "Data transfer G10" for basic settings where you can turn it on or off. When AUTOPRINT is active, the current weighing value will be sent via the RS 232 data interface after unloading and subsequent loading of the balance as soon as the balance is in resting position.

Permanent PRINT (continuous data output)

The setting Permanent Print is located on the menu item "Data transfer G10" for basic settings where you can turn it on or off. When Permanent Print is active, the current weighing values will be sent continuously via the RS 232 data interface.

Data output and remote control commands

The setting Remote Control Command is located on the menu item "Data transfer G10" for basic settings where you can turn it on or off.

Remote control commands transferred as ASCII characters to the balance can be used to trigger the following functions on the balance (always finish with CR, LF!):

- t Taring
- w The balance sends a weighing value (also unstable) via the serial interface.
- s The balance sends a stable weighing value via the serial interface.

After receiving either character w or s, the balance will send without a printer pause between the characters.

8.2.2 Explanation of the data transfer

Each data transfer is structured as follows:

Bit.Nr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	N	N	N	N	N	B	B	B	B	B	B	B	B	B	B	B	0	•	0	0

Bit.Nr.	21	22	23	24	25	26
	E	E	E	E	CR	LF

N	=	Numerator
B*:	=	Blank or for autotare on in zero range.
B, 0, , g:	=	Blank or weighing value giving unit according to loading of the balance
E	=	Unit
CR:	=	Carriage Return
LF:	=	Line Feed

8.3 Printer

The serial interface RS 232 facilitates the connection of a printer. The printout shows the weight in grams. In counting mode either the piece number or the weight details will be printed out.

In percentage mode the percentage proportion or the weight details will be printed out.

Printout will take place after pressing the PRINT key.

It is possible to number each printout continuously with the help of the numerator.

The numerator will be reset to (000) each time the balance is turned off or the CLEAR function is actuated.

8.4 Underfloor weighing

Objects which are unsuitable for placement on the weighing tray due to their size or shape can be weighed with the help of the underfloor weighing facility.

Proceed as follows:

- Switch off balance.
- Turn over the balance and in doing so take care that the weighing plate is not loaded.
- Open the closing lid on the bottom of your balance.
- Mount the hooks for underfloor weighing.
- Put the balance over an opening
- Suspend the goods to be weighed from the hook and carry out the weighing.



CAUTION

- Always ensure that all suspended objects are stable enough to hold the desired goods to be weighed safely (danger of breaking).
- Never suspend loads that exceed the stated maximum load (max) (danger of breaking)
- Always ensure that there are no persons, animals or objects that might be damaged underneath the load.



After completing the underfloor weighing the opening on the bottom of the balance must always be closed (dust protection).

9 Service, maintenance, disposal

9.1 Cleaning

Before cleaning, please disconnect the appliance from the operating voltage.

Please do not use aggressive cleaning agents (solvents or similar agents), but a cloth dampened with mild soap suds. Ensure that no liquid penetrates into the device and wipe with a dry soft cloth. Loose residue sample/powder can be removed carefully with a brush or manual vacuum cleaner.

Spilled weighing goods must be removed immediately.

9.2 Service, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN. Before opening, disconnect from power supply.

9.3 Disposal

Disposal of packaging and appliance must be carried out by operator according to valid national or regional law of the location where the appliance is used.

10 Instant help

In case of an error in the program process, briefly turn off the balance and disconnect from power supply. The weighing process must then be restarted from the beginning.

Help:

Fault

Possible cause

The displayed weight does not glow.

- The balance is not switched on.
- The mains supply connection has been interrupted (mains cable not plugged in/faulty).
- Power supply interrupted.

The displayed weight is permanently changing

- Draught/air movement
- Table/floor vibrations
- Weighing plate has contact with other objects.
- Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

The weighing value is obviously wrong

- The display of the balance is not at zero
- Adjustment is no longer correct.
- Great fluctuations in temperature.
- Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

Should other error messages occur, switch balance off and then on again. If the error message remains inform manufacturer.

11 Declaration of conformity



KERN & Sohn GmbH

D-72322 Balingen-Frommern

Postfach 4052

E-Mail: info@kern-sohn.de

Tel: 0049-[0]7433- 9933-0

Fax: 0049-[0]7433-9933-149

Internet: www.kern-sohn.de

Declaration of conformity

EC-Konformitätserklärung

EC- Déclaration de conformité

EC-Dichiarazione di conformità

EC- Declaração de conformidade

EC-Deklaracja zgodności

EC-Declaration of -Conformity

EC-Declaración de Conformidad

EC-Conformiteitverklaring

EC- Prohlášení o shode

ЕС-Заявление о соответствии

D	Konformitäts- erklärung	Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.
GB	Declaration of conformity	We hereby declare that the product to which this declaration refers conforms with the following standards.
CZ	Prohlášení o shode	Tímto prohlašujeme, že výrobek, kterého se toto prohlášení týká, je v souladu s níže uvedenými normami.
E	Declaración de conformidad	Manifetamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las normas siguientes
F	Déclaration de conformité	Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.
I	Dichiarazione di conformità	Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.
NL	Conformiteit- verklaring	Wij verklaren hiermede dat het product, waarop deze verklaring betrekking heeft, met de hierna vermelde normen overeenstemt.
P	Declaração de conformidade	Declaramos por meio da presente que o produto no qual se refere esta declaração, corresponde às normas seguintes.
PL	Deklaracja zgodności	Niniejszym oświadczamy, że produkt, którego niniejsze oświadczenie dotyczy, jest zgodny z poniższymi normami.
RUS	Заявление о соответствии	Мы заявляем, что продукт, к которому относится данная декларация, соответствует перечисленным ниже нормам.

Electronic Balance: KERN PKP / PKS

EU Directive	Standards
2004/108/EC	EN 55011: 2009+A1 :2010 EN 55022: 2010/AC:2011 EN 55024: 2010 EN45501 : 1992-10+AC :1993-08 OIML R 76-1 : 2006 OIML R 76-2 : 2006
2006/95/EC	EN60950

Datum 08.04.2013
Date

Ort der Ausstellung 72336 Balingen
Place of issue

Signatur
Signature

Albert Sauter
KERN & Sohn GmbH
Geschäftsführer
Managing director

KERN & Sohn GmbH, Ziegelei 1, D-72336 Balingen, Tel. +49-[0]7433/9933-0
Fax +49-[0]7433/9933-149, E-Mail: info@kern-sohn.com, Internet: www.kern-sohn.com